REMARKS/ARGUMENTS

Applicants respond herein to the Office Action of January 9, 2009.

Claims 1-18 are pending in the Application. All claims were rejected in the Office Action. Applicants amend Claims 1-18 and respectfully request a reconsideration of the rejections.

The disclosure of the Application was objected to by the Examiner because it contained a typographical error. Applicants amended the specification to correct the error and respectfully request withdrawal of the objection.

Claims 10, 17 and 18 were objected to because of certain informalities. Applicants corrected the indicated informalities and respectfully request withdrawal of the objections.

Claims 1-6, 10-14, 17 and 18 were rejected in the Office Action under 35 U.S.C. 103(a) as being unpatentable over Paulsen et al. (U.S. Patent No. 3,490,059) in view of Brannon (U.S. Patent No. 5,854,622).

As recited in amended Claims 1, 10, 17 and 18, the controller device of the present Application includes four arms 14 each terminating in a connecting joint 17/30. Each joint restricts and senses translational motion within the corresponding arm in the plane normal to the arm's axis. Further, each joint allows rotational motion about any axis and translational motion along the arm's axis. Each arm and associated ball-in-hole joint provides two degrees of sensed constraint. These are clearly not suspensors of the type defined in Paulsen and are radically different from Paulsen.

Contrary to the recitations of Claims 1, 10, 17 and 18, Paulsen discloses essentially a torque-only responsive device requiring four or more suspensors. When referring to the suspensors, Paulsen teaches: "In any form they are compliant in torsion and flexure but are axially stiff." See, Paulsen, col. 2, line 27. Thus, each suspensor is designed to prevent translational motion along the suspensor's axis while allowing rotational motion about any axis and translational motion normal to the suspensor's axis. Therefore, in the Paulsen's device, it is impossible to measure any translational force because no translational movement is possible. In other words, each suspensor provides a single degree of constraint and does not measure the force acting along this degree of constraint.

In paragraph 7 of the Office Action, the Examiner refers to what is almost an incidental option within Paulsen, i.e., the portion of the disclosure indicating that the four suspensors can be

arranged and intersect a point and be normal to the faces of a tetrahedron. Paulsen then points out the alternative of six suspensors arranged to be normal to the faces of a cube. The examples of Paulsen are confined to this latter option but understanding and applying Paulsen's suggestion of four suspensors to be normal to the faces of a tetrahedron does not in fact lead towards the apparatus recited in the present independent claims because of the disclosure of what in fact the "suspensors" are in Paulsen and how they are implemented and constrained.

At page 4 of the Office Action, the Examiner states "the arms are in 8 degrees of the constraint (fig. 2)". This is incorrect. Each of Paulsen's suspensors has a single degree of constraint with the sum of individual constraints being four or six for the four and six-suspensor embodiments, respectively. Due to geometric alignment, most easily seen in the six suspensor embodiment, each pair of the axially aligned arms implement the same degree of axial constraint resulting in a mechanism with a total of three translational constraints. Thus, Paulsen's device provides, as intended, three degrees of translational constraint and three degrees of rotational freedom and so being a flexural pivot.

Further, Fig. 2 of Paulsen shows the non-tetragon embodiment of the suspensors. Specifically, the six arm suspensors pass through respective clearance bores in the respective parts of the cruciform platform 92. The bore provides a clearance within which the suspensors can flex and can have any shape. The illustrated suspensors are rigid rods having at each end highly reduced diameter necks 120 and as noted in column 6, line 73, the device provides "torque and sensing". In contrast, the cylindrical bores 30 of the apparatus recited in the present claims are in contact with the spherical tip of the flexing arm member to provide a ball-in-hole joint. It is vital to note that this device of Paulsen simply does not respond to any applied force or any applied torque.

Further, as a system Paulsen's suspensor and central body mechanism implements a flexural pivot providing translational rigidity and rotational freedom. In contrast the recited device implements both translational and rotational stiffness for the purpose of sensing all six force and torque components.

Accordingly, independent Claims 1, 10, 17 and 18 recite a fundamentally different geometry and different mechanism compared with the teaching of Paulsen et al. Further, Paulsen does not have any suggestion of measuring a response in the suspensors to any force or any torque applied to the gripping device and transmitted from the gripping device to the arms.

As explained above, the suspensors of the Paulsen are configured to prevent any translational motion, i.e., any translational response. Therefore, the above-discussed limitations of Claims 1, 10, 17 and 18 are not disclosed or even suggested by Paulsen.

Brannon does not remedy the above deficiency of Paulsen. Therefore, Claims 1, 10, 17 and 18 are allowable over the cited prior art. Moreover, Claims 2-6 and 11-14 depend from Claims 1 and 10, respectively. Therefore, Claims 2-6 and 11-14 are allowable over the cited prior art at least for the same reasons as Claims 1 and 10 and further on their own merits.

Claims 7 - 9, 15 and 16 were rejected in the Office Action under 35 U.S.C. 103(a) as being unpatentable over Paulsen in view of Brannon and further in view of Hilton et al (U.S. Patent No. 5,798,748). Claims 7 - 9, 15 and 16 depend from Claims 1 and 10, respectively. Therefore, Claims 7 - 9, 15 and 16 are allowable over the cited prior art at least for the same reasons as Claims 1 and 10 and further on their own merits.

Favorable reconsideration of the rejections and allowance of all pending claims is respectfully requested.

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